DRAFT – FOR DISCUSSION PURPOSE

OFF-ROAD EQUIPMENT WHITE PAPER

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- Commercial Equipment (Compressors, Pumps, etc.)
- Transportation Refrigeration Units (TRU)
- Miscellaneous Equipment

III. Potential Emission Reduction Technologies

1. Overview: types of technologies; potential NOx reduction percentages; toxics and GHG co-benefits

- Cleaner Combustion Engines
  - Application – Heavy-duty engines > 300 hp
  - Potential Technologies
    - Aftertreatment and engine modifications (SCR, DPF) (generally implemented already)

- Hybrid Systems
  - Application –
    1. Equipment with energy recovery duty cycles or high percentage of idle/low power operation
    2. Equipment operating at remote sites with diesel fuel
  - Potential Technologies
    - hybrid-electric, hybrids with zero emission miles, etc.

- Alternative Fuels
  - Application –
    1. Equipment at fixed sites or returning to equipment yards
  - Potential Technologies
    - CNG/LNG; other alternative fuels; alternative fuels with hybrid systems

- Plug-In Hybrid Electric Systems
  - Application –
    1. Equipment with energy recovery duty cycles or high percentage of idle/low power operation.
    2. Equipment can operate at remote sites with conventional fuel or grid power if available at job site.
  - Potential Technologies
    - Plug-in hybrid-electric, hybrids with zero emission miles, etc.

- Fuel Cell
  - Application –
    1. Equipment with access to fueling infrastructure (i.e., equipment at fixed sites or returning to equipment yards at night)
  - Potential Technologies

        - Fuel cells for propulsion or for vocation (e.g., lifts, etc.)

- Battery Electric
  - Application –
    1. Equipment with high percentage standby time or low load time and located at site with access to grid power
  - Potential Technologies
    - Fuel cells for propulsion or for vocation (e.g., lifts, etc.)

IV. Technology Penetration Potential Assessment

1. Aggregate potential reductions, and adequacy to meet attainment needs
   - Preliminary discussion of extent each technology has potential for—
     - business case
     - co-benefits for toxics, GHG, energy, mobility, local economy
   - Preliminary discussion of implementation/deployment challenges, e.g.—
     - technology feasibility
     - cost
     - infrastructure needs
     - operational impacts

V. Recommended Actions

1. Studies
2. Technology development and demonstration
3. Foster clean technology markets and technology deployment
   - Outreach, funding, incentives, project conditions, regulations
4. Infrastructure
   - Alternative Fuels
   - Electricity Generation/Charging
5. Funding
   - Public and private investments
6. Federal Assistance
7. Interagency Coordination
8. Public/Private Partnerships
9. Additional Recommendations??

References

Appendices